

EWEB wants customers to be prepared for disruptions on the electric system. This includes contingencies for electrical events that can damage equipment, and power outages. This advice applies whether the problem originates on the customer's system or the utility grid. EWEB's goal is to minimize electrical disruptions, however when they occur it is the responsibility of each customer to protect their equipment. Acting on this advice will minimize equipment damage, lost data, and business interruption.

Electrical events that disrupt equipment can be categorized into four types of events:

- **Outage** – No voltage that typically lasts seconds to hours.
- **Voltage Sag** – Low voltage that typically lasts milliseconds to seconds.
- **Voltage transient** – A rare and equipment-damaging event lasting milliseconds.
- **Imbalanced voltage** – A three-phase event when voltage between phases is not balanced.



EWEB has excellent reliability providing power to all customers an average of 99.98% of the time. However, there will be **outages** and customers need to have

contingency plans to support critical equipment. This may include the purchase or rental of a generator. If a generator is used, a transfer switch is required. A transfer switch prevents unsafe back-feeding of power onto the utility system. If critical equipment needs power 100% of the time, then "bridge power" is required, providing immediate and short-term power until a generator gets started. Commonly, an Uninterruptable Power Supply (UPS) is used for bridge power. A UPS stores energy in batteries, so it can provide energy to your critical equipment.

Is Your Equipment Protected?

Short-term **voltage sags** are common and will disrupt electronic loads. Typically, a UPS is used to allow critical equipment, like computers, to ride through a **voltage sag** without interruption. UPS will also work in outages providing either bridge power until a generator starts or sufficient time to properly shut-down equipment. The UPS run-time depends on the equipment load and UPS battery size. Although some UPS offer surge suppression, a quality Transient Voltage Surge Suppressor (TVSS) should be applied ahead of a UPS to protect the UPS.



Although **voltage transients** are rare, they can damage equipment, especially sensitive electronics. TVSS are recommended as a form of insurance to protect critical equipment. The best solution is to have a layered or tiered application where several TVSS are installed in a series. For example, a plug-in TVSS at the critical equipment (category A) preceded by another TVSS at a distribution panel (category B), and finally another TVSS at the main service panel (category C). This tiered approach is necessary to provide maximum protection as a single TVSS plug strip will not always be sufficient. TVSS should be certified by Underwriters Laboratory (UL) as 1449 version 3.

Imbalanced voltage only applies to 3-phase systems, not single phase systems. The most common and acute example of **imbalanced voltage** is when one or two of the three phases are lost. This situation is very serious for motors and will damage motors within seconds. Therefore, we recommend 3-phase customers take precautions to add "single-phase protection" to their motors. Essentially, this is a sensor that triggers a switch to automatically disconnect the motor during a severe voltage imbalance event.

If you have questions please call EWEB Power Quality at 541-685-7000 (select options 1, 5, 3 to bypass the automated operator). Also consult your electrician to determine how to best protect your equipment.